

- wide-area networking using the X.25 protocol. The OA&M workstation not only can monitor and control a single host system using point-to-point synchronous data links, it also can be connected to different host systems that are networked together using LAN communication software or dial-up facilities.

### **3.11.2. Diagnostics and Alarms**

**Provider should describe how service affecting failures will be detected, diagnosed, reported, and corrected. Provider should also indicate how service affecting outages will be reported to participating carriers.**

Failure management of the LNP SCP consists of two elements, status and control, as follows:

- *Status.* The SCP's maintenance and diagnostic system automatically monitors the status of processors, I/O controllers, power subsystems, and cabinet environments. Key data is logged and evaluated using rules-based, expert-system techniques to identify potential problems. Monitoring and evaluation occur while the system is on-line, with applications up and available to users. Diagnostics can be run from any remote center without disrupting service.
- *Control.* When a problem is identified, on-line corrections can be initiated, either automatically or manually.

The LNP SCP detects system malfunctions using a complete suite of on-line and off-line diagnostics. If the diagnostics detect a malfunction, it automatically removes the component from service and reports the change in status. The unit is then manually tested via the OA&M interface, and either replaced or returned to service.

All LNP SCP components, including the SCP Host NonStop Kernel operating system, node software, application processes, and the Communication Server, report specific events and alarms to the Exception Reporting and Alarm Distribution (ERAD) subsystem. ERAD collects messages, time stamps them, and converts them into user-readable event and alarm messages. ERAD logs these to its own file, and distributes them to output devices defined by the system-configuration parameters, normally the local and remote OA&M workstations described in Paragraph 3.11.1. The output of ERAD can be redirected from the OA&M workstations to printers or other alarm-handling devices. The ERAD messages may also be sent to a remote facility, such as a centralized maintenance and administration center, using an X.25 interface or over an Ethernet LAN connection.

### **3.11.3. Fault Tolerance**

**[No RFP statement provided]**

Fault tolerance is the ability of a system to sustain a fault while continuing to provide service. Fault tolerance considerations differ for hardware and software.

The more important component required for fault tolerance in the server world is fault-tolerant software. In combination with Tandem's parallel architecture, the LNP SCP NonStop Kernel and node software ensure the continuous availability of applications.

In a parallel-processing architecture, the workload is shared among processors that perform multiple tasks simultaneously. Under normal operations, all processors share the workload; there are no idle units. If the LNP SCP detects a processing error, it removes the faulty processor from the network and transfers the workload to other processors. This is true whether the fault is a defective hardware component or a transitory software difficulty. Similarly, if any I/O path or dual-ported device fails, the LNP SCP automatically uses an alternate path or, in the case of mirrored disc drives, an alternate device.

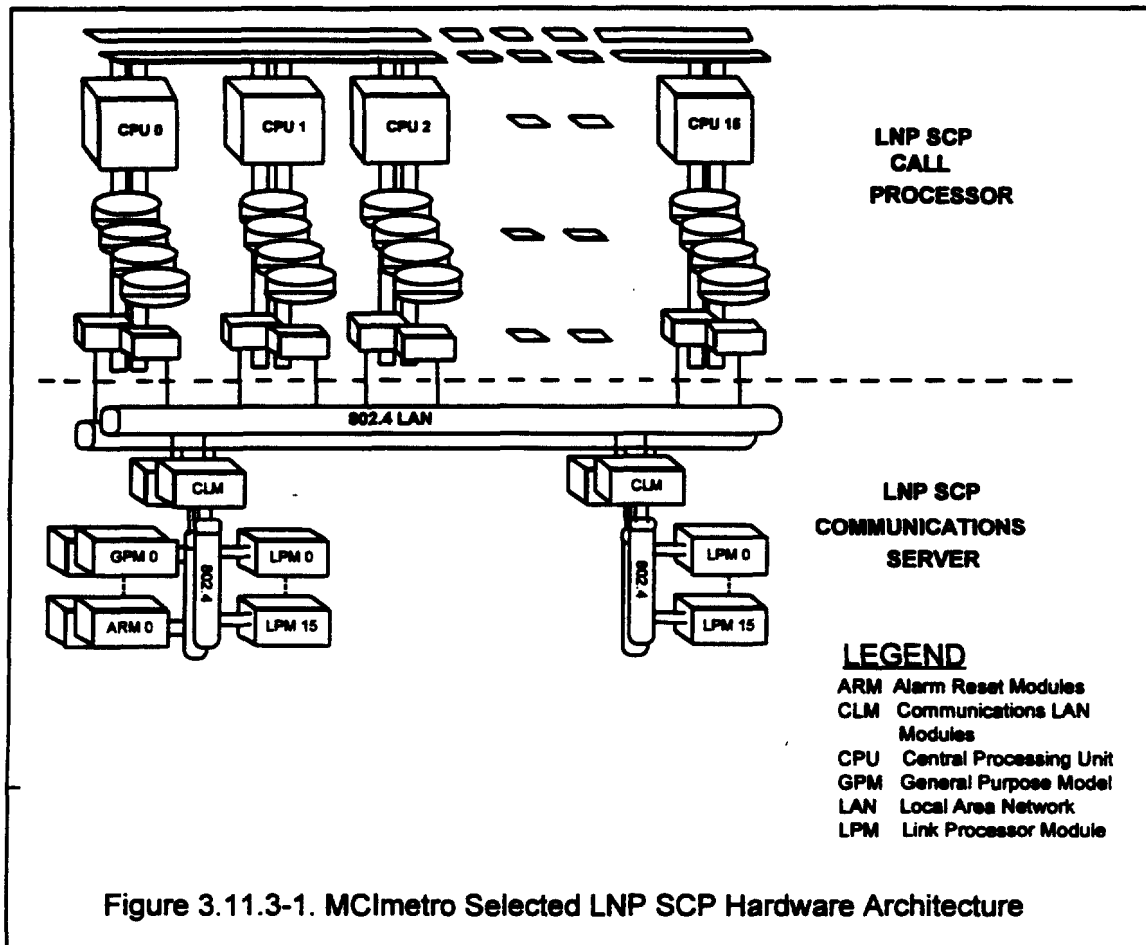
Our SCP has the industry's only software that provides a single system image across all servers in a distributed network, significantly lowering errors that can compromise an otherwise fault-tolerant system. Because of the hardware and software architecture, no single point of failure can prevent access to an application. In fact, multiple failures can generally be sustained. Multiple processors, fans, I/O channels, disc drives, etc. can fail and the system will continue to process the application.

Our system is also programmed to mitigate transitory software problems that are caused by specific dynamic circumstances. For example, it is possible that a fault could occur only when a heavy mix of queries are presented to the server while an operator is performing an alarm-management function. In this case, the operating system will sense the problem (application hang or loop) and disable the processor in which the fault occurred. The operating system will spread all resources, including the application processes, across the remaining processors. The maintenance and diagnostic system will diagnose the "down" processor and notify the system operator that a problem has occurred and the system is still operating normally. Although the likelihood of the exact circumstances occurring again is low, the OA&M workstation can obtain a 'dump' of the "down" processor, and the transitory software error potentially could be discovered and corrected. In the meantime, the system manager, if convinced that the problem was a transitory software condition, can restore the "down" processor and redistribute the workload.

We achieve hardware fault tolerance by using loosely coupled servers consisting of multiple processors, dual interprocessor buses, dual-ported controllers, dual-ported I/O devices, and redundant, load-sharing power subsystems. Other fault tolerant hardware

features include independent processor timing sources and multiple DC fans that automatically increase speed if one fan fails.

Our LNP SCP hardware consists of highly reliable components designed to meet stringent telecommunications-network requirements. Figure 3.11.3-1 shows how the hardware platform is divided into two distinct areas, the Call Processor and the Communications Server.



The LNP SCP Call Processor is based on the Tandem Himalaya family of processors. These high-performance, fault-tolerant call processors, operate independently in supporting a wide selection of I/O devices connected to dedicated, redundant I/O channels. The I/O devices are dual-ported controllers that provide both access to two of the independent processors and the interface to hard disk drives and other I/O devices, such as LAN and asynchronous ports, required by the LNP SCP platform configurations.

The SCP Communications Server is a front-end communications controller housed in a cabinet that meets the specifications listed in Tandem's General Product Requirements, ISD's Functional Requirements Specification for a Central Office Computing System, and Bellcore's Network Equipment-Building System (NEBS) specification. The SCP

Communications Server consists of fully redundant, microprocessor-based, printed-wiring communications assemblies, dual-rail power subsystem, and various electrical and physical interfaces.

**3.11.3.1. All critical components are duplicated with an active stand-by or load sharing design. This should include core processors/controllers, back plane busses, bus controllers, power supplies, timing sources, disk drives, cooling fans, etc.**

As discussed in the preceding Paragraph, 3.11.3, all critical components of the LNP SCP are engineered in a duplicated (load-sharing) configuration. These components include General Purpose Modules, Communication LAN Modules, and Alarm Reset Modules. The Link Processor Modules are not provisioned in redundant configurations since the SS7 Network linkset design already provides the required redundancy. Configurations include replicated application, node, and operating system software across multiple independent call processors. The dual-ported I/O devices allow access from two separate processors and are provisioned in duplicated or mirrored configurations.

The Call Processor and Communication Server are connected by duplicated 802.4 Token Bus LANs that operate in a load-sharing mode, although either LAN is capable of handling the entire system load.

**3.11.3.2. Failure of an active component should not interrupt any service, there should be a soft switch to the stand-by component. There should be no single point of failure and no required human action of any type for the system to remain in service for a single component failure.**

As discussed in Paragraph 3.11.3, failure of any active component of our LNP SCP will not cause interruption of network services. Moreover, because of the software fault tolerance, failure of several active components will not cause interruption of service. No human action is required to maintain uninterrupted service in the event of a component failure; this capability is provided through the redundant hardware operating in the active/active load-sharing state and the replication of the services across multiple call processors.

### **3.12. Feature Requirements**

**A basic tenet of the Local Number Portability Trial will be that subscriber perception of service remains unchanged for all subscribers.**

**This feature description is provided to focus on an existing set of subscriber features that should not be negatively impacted by the LNP trial. In general, these subscriber features are network derived or based and are considered to be well established, non-market differentiating, features within the service parity scope of the LNP trial.**

As part of our effort to make LNP transparent to the subscriber, we have performed and continue to perform extensive testing on our already successful prototype. These tests included feature interaction with Centrex, CLASS, and ISDN features. The test configuration includes a NORTEL DMS-100 and a Siemens Stromberg-Carlson EWSD as End Offices, a NORTEL DMS-250 and DSC MegaHub-600E as IXC switches, DSC MegaHub STPs, and a Tandem SCP as the LNP database. Test LNP queries have included both IN and AIN 0.1 types. Both CLASS and other features have been successfully tested to date:

- CLASS features include:
  - Calling Number Delivery
  - Calling Number Delivery Blocking
  - Selective Call Rejection
  - Automatic Recall
  - Automatic Callback
- Other features include:
  - Three-way Calling
  - Last Number Redial
  - Call Waiting
  - Cancel Call Waiting
  - Call Forwarding
  - Call Forwarding No Answer

Our testing has confirmed that standards modifications are required to support Automatic Recall and Automatic Callback when using an AIN 0.1 PODP trigger. This is discussed in our response to RFP paragraph 3.12.1.

During the trial, we will design measurements and follow up to ensure that subscriber perception is not only unchanged in the trial environment, but also unchanged in the full-scale operational environment.

### **3.12.1. Specific Feature Requirements**

**With the implementation of LNP, it is required that the existing set of subscriber features not be negatively impacted. Provider must describe how their LNP solution interacts with each of the following features (including the signaling messages required). The descriptions should also specifically identify any changes required to existing standards for signaling or feature operation.**

- **Automatic Recall**
- **Automatic Callback**
- **Calling Name Delivery**
- **Screening List Editing for Selective Call Forwarding, Selective Call Rejection, etc.**
- **Calling Number Delivery and Call Privacy**
- **ISDN Call Forwarding**
- **Network Voice Message Service**
- **Customer Originated Trace**

**Any other subscriber features that will be impacted under the proposed LNP solution should also be described.**

**If the proposed solution utilizes an AIN 0.1 trigger, feature interactions between that trigger and switch based features should be described. Any AIN anticipated functionality that is now limited by utilizing a specific trigger for LNP should also be described.**

**Table 3.12.1-1 provides a summary of the anticipated feature interactions. Narrative text following Table 3.12.1-1 explains these interactions.**

**Table 3.12.1-1 Summary of LNP effect on features**

<b>Features</b>	<b>AIN PODP Method</b>	<b>IN Method</b>	<b>10D GTT<sup>(1)</sup></b>	<b>Comments</b>
Automatic Recall	*	✓	Yes	The AIN 0.1 specifications prohibit activation of Automatic Recall for a number that is subject to an AIN 0.1 PODP trigger
Automatic Callback	*	✓	Yes	The AIN 0.1 specifications prohibit activation of Automatic Callback for a number that is subject to an AIN 0.1 PODP trigger
Calling Name Delivery	+	+	Yes	This assumes separate name databases are used by each service provider
Screening List Editing for Selective Call Forwarding and Rejection	✓	✓	Yes	
Calling Number Delivery and Call Privacy	✓	✓	No	
ISDN Call Forwarding	+	+	No	If TCAP DN validation is selected, then 10-digit GTT may be required
Network Voice Message Service	+	+	Yes	
Customer Originated Trace	+	+	No	

**Table Legend:**

✓	Prototype testing indicates no negative impact on feature.
+	Not tested, but analysis suggests no negative impact on feature.
*	Existing specifications must be modified to preclude possible negative impact on feature.
Note 1: This column indicates whether 10-digit Global Title Translation (GTT) is necessary to access the correct database.	

## Discussion of features

- Automatic Recall (TR-NWT-000227) & Automatic Callback (TR-NWT-000215)
  - Using the IN method, the real NPA of the calling party is used in the memory slot. There are no known feature interaction problems between Automatic Callback or Automatic Recall and LNP triggers that utilize TR-533-based TCAP IN queries. The logic that determines whether the other subscriber is within the same switch may need minor enhancements.
  - Using the AIN 0.1 method, the TR-1284 interface guidelines for AIN 0.1 define the interaction between Automatic Callback/Automatic Recall and AIN 0.1 as follows: "If the destination of CLASS Automatic Callback or Automatic Recall is associated with a PODP trigger, the Automatic Callback/Automatic Recall request shall receive denial treatment. If the destination is equipped with a Terminating Attempt Trigger, the Automatic Callback/Automatic Recall request shall execute in the normal fashion ignoring the presence of the trigger." An Automatic Recall requested by a ported number will only fail if the trigger is located in the switch originating the recall request. For broad-scale implementation, we suggest that the AIN 0.1 specifications be modified to allow the interworking of such features and triggers. We are prepared to work with the participating Companies and industry standards groups in defining the optimal solution for in implementing an AIN-based LNP query. In the longer term, LNP may require the development of a different trigger that will not have any conflicts with CLASS or other features.
- Calling Name Delivery (TR-NWT-1188)
  - Using the IN method, the real NPA of the Calling Party Number will be used for the TCAP query to the Customer Name database. Our solution does not modify the Calling Party Number, and thus will not affect this feature.
  - Using the AIN 0.1 method, the Calling Party Name field is not affected by our solution, and this feature will work correctly.
- Screening List editing (TR-NWT-000220) for Selective Call Forwarding (TR-NWT-000217) and Selective Call Rejection (TR-NWT-000218)



- Using the IN method, the real NPA of the Calling Party Number is used in the screening list. Our LNP model does not affect the operation of the features.
  - Using the AIN 0.1 method, our solution does not alter the Calling Party Number field at any trigger point, allowing it to be used for this feature. Switches serving a ported number must ensure that on outgoing calls, the Calling Party Number is in the format NPA-NXX-XXXX. This feature has been tested on our prototype and works correctly.
- Calling Number Delivery and Call Privacy (TR-NWT-000031)
  - Using the IN method, the real NPA of the Calling Party Number is delivered to the called party. Because our solution does not alter the Calling Party Number, this feature is expected to work correctly.
  - Using the AIN 0.1 method, our solution does not alter the Calling Party Number field at any trigger point, allowing it to be used for this feature. Switches serving a ported number must ensure that on outgoing calls, the Calling Party Number is in the format NPA-NXX-XXXX. This feature has been tested on our prototype and works correctly.
- ISDN Call Forwarding
  - In the IN method, the real NPA of the forwarded number is used for the TCAP query during ISDN Call Forwarding activation. This feature is expected to work correctly with our solution.
  - In the AIN 0.1 method, our solution does not alter the Calling Party Number field at any trigger point, allowing it to be used for this feature. Switches serving a ported number must ensure that on outgoing calls, the Calling Party Number is in the format NPA-NXX-XXXX. This feature is expected to work correctly.
- Network Voice Message Service
  - Using the IN method, the real NPA of the redirecting digits should be used in the ISUP message (IAM) sent to the Voice Messaging Service (VMS) Host switch. The real NPA of the Voice Messaging Service subscriber should be used in the TCAP message sent to the subscriber's switch from the VMS Host switch. No feature interaction problems are known or anticipated for this feature.

- Using the AIN 0.1 method, our experience makes us confident that interfacing to an SMDI voice-mail system, locally or on a network basis, will work correctly. In the recipient terminating switch, the CPC is swapped back to NPA in the called party number field early in translations. All subsequent activities related to the call, including Call Forwarding to SMDI, work correctly.
- Customer Originated Trace
  - In the IN method, the real NPA of the Calling party is used for the trace. There are no feature interaction problems known or anticipated for this feature.
  - In the AIN 0.1 method, our solution does not alter the Calling Party Number field at any trigger point, allowing it to be used for this feature. Switches serving a ported number must ensure that on outgoing calls, the Calling Party Number is in the format NPA-NXX-XXXX. This feature is expected to work correctly.

### 3.13. Technical References and Advisories

Provider shall detail any exceptions to the following Bellcore Technical References (TR) and Technical Advisories (TA).

Document Number	Issue	Date	Title
TR-EOP-000063	3	3/88	Network Equipment Building System General Requirements (NEBS)
-			
TR-NPL-000258	1	10/85	Compatibility Information for Feature Group D Switched Access Service
TR-ISD-000325	1	9/86	Equipment Information Required From Suppliers or Operations Systems
TR-NPL- 000275	1	4/86	Inter-LATA Network Notes
TR-TSY-000039	2	6/85	Quality Program Analysis
TR-TSY-000069	1	3/89	Comptroller's Automatic Message Format
TR-TSY-000078	2	12/88	General Physical Design Requirements for Communications Products and Equipment
TR-TSY-000282	1	11/86	Software Reliability and Quality Acceptance Criteria (SRQAC)

<b>TR-TSY-000284</b>	<b>1</b>	<b>11/86</b>	<b>Reliability and Quality Acceptance Systems Generic Requirements (RQSSGR)</b>
<b>TR-TSY-000332</b>	<b>2</b>	<b>7/88</b>	<b>Reliability Prediction Procedures for Electronic Equipment</b>
<b>TR-TSY-000439</b>	<b>2</b>	<b>2/88</b>	<b>Operations Technology Generic Requirements</b>
<b>TR-TSY-000796</b>	<b>1</b>	<b>4/88</b>	<b>Reliability and Quality Generic Requirements</b>
<b>TA-TSY-000 179</b>	<b>2</b>	<b>3/88</b>	<b>Software Quality Program Requirements</b>
<b>TA-TSY-000204</b>	<b>2</b>	<b>6/87</b>	<b>User System Interface</b>
<b>TA-TSY-000351</b>	<b>1</b>	<b>1/86</b>	<b>Bulk Billing Requirements</b>
<b>TA-TSY-000413</b>	<b>1</b>	<b>10/86</b>	<b>Generic Requirements for AMA</b>
<b>TA-TSY-000788</b>	<b>1</b>	<b>6/88</b>	<b>AMATPS Enhanced Communications</b>
<b>TA-TSY-000929</b>	<b>1</b>	<b>4/89</b>	<b>Reliability and Quality Measurements for Telecommunications (RQMS)</b>
<b>TA-EOP-000386</b>	<b>1</b>	<b>5/89</b>	<b>NEBS Systems Assembly and Cable Distribution Interface</b>
<b>TA-TSY-000870</b>	<b>1</b>	<b>4/88</b>	<b>Electrostatic Discharge Control in the Manufacture of Telecommunication Equipment</b>

Our solution is embodied in a single (mated-pair) Tandem LNP SCP. To the extent that we have been able to ascertain applicability of the above documents, our solution is compliant.

Table 3.13 lists the documents that we believe are applicable to this device, along with our assessment of the SCP's compliance with each of these documents.

**Table 3.13-1 Technical Reference and Advisories Compliance Summary**

<b>Document No.</b>	<b>Issue</b>	<b>Date</b>	<b>Title</b>	<b>Compliance</b>
TR-NWT-000029	1	10/90	Service Control Point Node Generic Requirements for IN	High
TR-EOP-000063	4	7/91	Network Equipment Building - System (NEBS) Generic Equipment Requirements	High
TR-NWT-000246	2	6/91	Bell Communications Research Specification of Signaling System Number 7	High
TA-NWT-000365	3	8/90	SCP Node/SEAS, SCP Node/SMS Generic Interface Specification	High
GR-1280-CORE	1	8/93	Advanced Intelligent Network (AIN) Service Control Point (SCP) Generic Requirements	Medium
TR-NWT-001285	1	8/92	Advanced Intelligent Network (AIN) Switch-Service Control Point (SCP) Application Protocol Interface Generic Requirements	High

The Tandem SCP has a proven record of reliability in existing network installations. It is currently deployed in 187 telephone networks throughout the world. There are 78 Tandem SCPs presently deployed in the United States, many of which serve as E911 call-routing databases. The only difference between these SCPs and our LNP SCP is some LNP-application-specific software.

As further evidence of its compliance with existing standards, Tandem has earned both hardware and software certifications that are at least comparable to those described in Bellcore's TR-TSY-000179. Tandem's hardware manufacturing process has achieved ISO certification; its software has achieved the Level 2 Capability Maturity Model of the Software Engineering Institute.

## **4. MAINTENANCE AND TECHNICAL SUPPORT**

### **4.1. General**

**This Section represents the Companies' requirements during the trial for maintenance, operations and technical support services. Provider should explain all procedures and processes associated with such services. Where more than one Product is being proposed, Provider shall respond individually for each Product and must not mix responses together. Provider may also wish to offer an alternative Proposal. Any alternative Proposal must be in addition to the requested information and clearly identified as a separate and alternative Proposal. Provider shall provide any and all information that could reasonably be considered necessary in evaluating its product.**

We will provide system-level maintenance, operations, and technical-support services throughout the trial period. During the pre-trial period, we will work directly with each participating carrier's operations and maintenance support organizations to ensure that the trial:

- Causes no service interruption to any subscriber.
- Does not adversely impact any billing process or other operations/administration system.
- Meets every performance, measurement, and data-collection requirement.
- Integrates smoothly into each participant's existing operations and maintenance infrastructure.

Early in the pre-trial period, we will develop and publish system-level operations and maintenance processes and procedures that will reflect a fully integrated system-level approach.

The heart of our solution is a Service Control Point that houses the LNP database. This unit will be a Tandem Computers' SCP, the same type of device that proved successful in our laboratory prototype. The Tandem SCP is the only hardware equipment we propose for this trial, and we will employ Tandem to perform any maintenance needed on the LNP SCP.

Tandem's excellent reputation for telecommunications reliability is the result of both technical features—availability, reliability, built-in redundancy, and on-line parts replacement without interrupting system processing activities and superior maintenance infrastructure, with continuous on-line maintenance support. A study of all trouble reports received by the company between 1985 and 1990 yielded a mean time between hardware failures of approximately 300 years.

In 1989, with more than 10,000 reported hardware faults in the installed base of approximately 9000 systems, only 29 resulted in a system outage. The same study calculated a mean time to repair of 4 hours, and a median time of one hour. [*A Census of Tandem System Availability Between 1985 and 1990*, Dr. Jim Gray, Tandem Technical Report 90.1]

#### **4.2. Provider's Response to this Section**

**The Companies expect clear, concise and pertinent responses to each paragraph in this Section 4. If Provider responds in a manner that fails to address a given paragraph, Provider's response will be deemed non-compliant. Provider's Proposal must utilize an identical numbering scheme to that used by the Companies in this Section. The format of Provider's response must show the Companies paragraph with Provider's response immediately following such paragraph.**

Our proposal format complies with the requirement. We have attempted to provide clear, concise, and complete responses that will facilitate the evaluation process.

#### **4.3. Maintenance and Technical Support**

**The Provider must have technical support available during normal business hours for testing during Phase 1 of the trial. During Phase 2 and Phase 3 Provider must have technical support available 24 hours a day 7 days per week. Will Provider comply? If so, provide a detailed description of the maintenance & technical Support offered.**

MCImetro's technical support team consists of:

- MCImetro support engineers and system-level experts whose aggregate expertise and capabilities will be applied to planning, support, advice, and assistance to all trial participants.
- Tandem Computers LNP SCP Project Manager, LNP SCP engineers, and LNP SCP operational technicians, supported by the existing Tandem technical support and maintenance infrastructure.

We will provide technical support during normal business hours throughout Phase 1 of the trial, and continuous technical support, 24 hours a day, 7 days per week, during Phases 2 and 3 and the trial-exit period. LNP SCP technical support will be provided during normal business hours until the trial LNP SCP is activated. Once this unit is activated (prior to Phase 1), Tandem Computers will provide technical support 24 hours a day, 7 days per week, until the LNP SCP is removed from service in conjunction with post-trial exit.

With all equipment maintenance the responsibility of Tandem Computers, we are able to rely on that company's systems approach, which effectively merges both hardware and software expertise at both the on-site and on-line levels. At the systems level, support specialists use expert system-based tools to monitor hardware and software processes.

The first level of LNP SCP support is provided by a Tandem LNP SCP team that includes the following members:

- LNP SCP Project Manager – Has overall responsibility for all day-to-day maintenance and support activities relating to the LNP SCP database; is the contact point regarding these activities.
- LNP SCP Operational Technician – Is available to maintain the hardware and software supplied by Tandem Computers; has expertise in system generations, configurations, and operations.
- LNP SCP Engineer – Is responsible for the SCP and its associated LNP application; is a subject-matter expert capable of making on-line changes if required.

This team, supplemented by a hardware-support engineer assigned for the duration of the trial, is located at the site selected for the deployment of the "mated pair" LNP SCP and is available during normal business hours during Phase 1. Additionally, team personnel are available on call when needed outside of business hours.

In Phases 2 and 3, the team will be available 24 hours a day, 7 days a week, for the duration of the trial.

Our support engineers are experienced and highly trained with each receiving more than 120 hours of training annually. The assigned support engineer will participate from installation, through the three phases of the trial, and through trial exit.

Each LNP SCP support-team member is authorized to obtain a higher level assistance without delay. Paragraph 4.4 discusses this advanced level of support.

#### **4.4. Emergency Technical Support**

**The Provider must have emergency technical support available 24 hours a day in the event of an emergency during the term of the trial. Will Provider comply? If so, provide a detailed description of the support offered.**

We will provide 24-hour-per-day, 365-day-per-year problem notification to the Tandem NonStop Support Center, which provides immediate software support via system-to-system links or by telephone, and arrange for on-site assistance, if required. This center answers both usage and defect questions, and performs remote diagnostics via system-to-

system links. This level of support can be configured to occur automatically. That is, the system can be configured to call the Tandem NonStop Support Center (or any other center) should the diagnostic expert system determine that there has been a deviation from normal in either software or hardware operation.

Although 75 percent of all SCP problems are solved at the Tandem NonStop Support Center, some issues or problems require additional resources. In those cases, the Support Center passes the problem to one of the Systems Support Group offices located in various regions for the world. With its higher level of support expertise and a complete range of diagnostic hardware and software tools, the System Support Group determines the solution and returns it to the NonStop Support Center for implementation.

For problems requiring extraordinary support and resources, the Systems Support Group can escalate the problem to experts within Tandem's corporate headquarters. In a crisis or system-down situation, the Systems Support Group and corporate escalation programs work together on a real-time basis to solve the problem.

**4.4.1. Will Provider's staff be able to access the Product to restore it to full service with assistance from the Companies maintenance staffs on-site if required? Does Provider have capability to have dial-up access to the Product and security provisions to ensure that no unauthorized persons can access the Product. Please provide information about remote restoration capability.**

The LNP SCP is accessible from either local or remote workstations, a capability that can be extended to the participating Companies' maintenance staffs. The LNP SCP employs Expand, a Tandem network operating system that is tightly coupled to the LNP SCP operating system. Expand incorporates such enhanced features as:

- Two-terminal debugging; which allows any changes made on either terminal to be displayed on both simultaneously.
- Simultaneous multiple file transfers.
- File transfers that retain that "Last-modified-time" stamps.
- File transfers that retain that "End of File" values.

These last two items, "Last-modified-time" and "End of File" permit quick verification that the latest file was transferred and that it was received in its entirety.

The LNP SCP has been certified with a "C2" security level of trust by the United States government. The equipment provides multiple layers of security. Only authorized users, with passwords, can gain access to:

- The application, through the application layer



- The command line, through the operating system
- Each individual file
- Each individual terminal, workstation, disc drive, communications line, or tape drive.

#### **4.5. Software Support**

**[No RFP Paragraph provided]**

The Paragraphs in this section describe Tandem software support for the LNP SCP database equipment.

**4.5.1. Provider shall provide details of the duration of Product downtime during upgrades. Such detail shall include the duration, if any, that signal processing will be lost.**

We can upgrade software under either of the following conditions:

- On-line. All common configuration changes are accomplished with no downtime of the system and no interruption of call processing.
- Near On-line. Where major subsystems are to be replaced, much of the work can be done in advance, with no interruption of service. When the subsystem is stopped and restarted for changeover, the outage may range from seconds to several minutes. Even then, because we use a "Mated Pair" implementation, there is no interruption of signal processing.

**4.5.2. Provider is expected to provide Software patches and fixes at no charge during the term of the trial. Will Provider comply?**

We will provide software patches and fixes to installed code at no charge throughout the period of the trial.

#### **4.6.**

**[No RFP Paragraph provided]**

#### **4.7. Documentation**

**During the trial Provider is expected to provide Documentation to participating Companies which shall include, but not be limited to: practices, procedures, manuals, drawings, diagrams, pictures, and other documents to be used by the**

participating Companies in their day-to-day operations. These documents must cover all activities necessary for the planning, engineering, ordering, provisioning, testing, training, operations, maintenance and repair functions associated with Hardware and Software used by the participating Companies. Document protection requirements of the Provider should be included in the response. If necessary, document protection agreements may be entered into on a company-by-company basis.

MCImetro will provide documentation to participating Companies covering all activities necessary for the planning, engineering, ordering, provisioning, testing, training, operations, maintenance, and repair functions associated with hardware, software, and trunks. These documents will support Companies in their LNP planning and their day-to-day operations. These documents will be non-proprietary, with any proprietary portions published separately. Table 4.7-1, lists representative publications and a sampling of their contents.

During the early part of the pre-trial period we will identify any document protection requirements and work cooperate fully in reaching document protection agreements.

**Table 4.7-1 Representative LNP Trial Publications**

Document	Example Contents	Comments
LNP Trial Interface Planning and Implementation	Interface selection	<ul style="list-style-type: none"> <li>• Provides information to help participants choose interface type.</li> <li>• Includes a comprehensive listing of pros and cons.</li> <li>• Describes service features, subscriber perception, billing-information protection, etc.</li> </ul>
	Engineering, ordering, provisioning, test planning, and training requirements	<ul style="list-style-type: none"> <li>• Includes coordination mechanisms to facilitate implementation.</li> <li>• Includes sample schedules and other management planning and tracking elements.</li> <li>• Summarizes anticipated test-data collection mechanisms (e.g. pre-established SCP data collection profile), sample data outputs, and a preliminary listing of metrics.</li> <li>• Lists skill requirements and training courses.</li> </ul>

Document	Example Contents	Comments
LNP Trial Operation and Maintenance Support	Operations	<ul style="list-style-type: none"> <li>• Describes roles and relationships of participants throughout the trial and trial-exit period.</li> <li>• Describes how to deal with special problems and emergency situations.</li> </ul>
	Maintenance	<ul style="list-style-type: none"> <li>• Describes maintenance support procedures from a system-level perspective for hardware and software provided by MCImetro, Tandem, and other participants.</li> </ul>
LNP Trial Testing	<ul style="list-style-type: none"> <li>• Schedule</li> <li>• Test points</li> <li>• Measurements and measuring mechanisms</li> <li>• Metrics</li> <li>• Trial success criteria</li> <li>• Data reduction and analysis requirements</li> <li>• Data analysis <ul style="list-style-type: none"> <li>– Trial and demonstration results</li> <li>– Extrapolation (models and simulation) for large scale implementation.</li> </ul> </li> </ul>	Helps ensure that trial captures all needed information for analysis, and that the test results are credible and can withstand technical scrutiny.
LNP Trial Course Materials	As needed, in support of training courses	Materials for distribution to class participants
Change- Management Process Document	Change-order execution procedure	<ul style="list-style-type: none"> <li>• Notifies participating service providers of change in portability status of NPA-NXX.</li> <li>• Notifies participating service providers that a subscriber is to be moved and when.</li> </ul>

#### 4.8. Right to Reproduce Documentation

The participating Companies shall have the right to reproduce manuals and Documentation for the purpose of engineering, installing, maintaining, repairing and operating the Products during the term of the trial. The participating Companies reproduction shall include the copyright or similar proprietary notices. Will Provider comply? Document protection requirements of the Provider should

**be included in the response. If necessary, document protection agreements may be entered into on a company-by-company basis.**

We authorize participating Companies to reproduce the manuals discussed in our response to RFP Paragraph 4.7 for the purpose of engineering, installing, maintaining, repairing, and operating the products during the term of the trial. We understand that the participating Companies' reproductions will include copyright or similar proprietary notices.

This agreement does not extend to the maintenance manuals of vendors who will be supplying hardware and associated maintenance (e.g., for Service Control Points) during the trial. These and other proprietary documents and materials not needed to ensure the integrity and success of the trial will not be supplied. MCImetro will, of course, coordinate closely with all parties to ensure that any concerns are adequately addressed. Further, if a need for access to proprietary information does arise, we will facilitate the needed action. MCImetro will comply with RFP Paragraph 4.8.

MCImetro does not have any document protection requirements at this time, and does not anticipate creating any that would affect this trial or the participants.

#### **4.9. Training**

**The participating Companies will require all the necessary courses that will enable the participating Companies to plan, engineer, provision, install, operate, test, maintain and repair the Product as necessary for the duration of the trial, particularly if the Provider does not provide these function's during the trial at no charge. The participating Companies would expect such training at no charge. Will Provider comply?**

MCImetro will provide training at no charge to participating Companies to enable them to plan, engineer, provision, install, operate, and perform testing during the trial.

MCImetro and its supporting vendors will provide maintenance and repair support for all hardware (and component software) provided by MCImetro for the trial period. The LNP SCP is our only proposed new equipment needed for the trial; this will be maintained by Tandem Computers' own thoroughly trained personnel. Because we will also provide LNP "system level" maintenance coordination support, only limited maintenance and repair training will be required for participating companies. Table 4.9-1 lists our projections for training courses.

**Table 4.9-1 MCImetro Projected LNP Trial Training Courses.**

<b>Course</b>	<b>Duration</b>	<b>Comments</b>
<b>LNP Trial Course</b>	<b>1 day</b>	<ul style="list-style-type: none"> <li>• Will help managers and engineers decide whether to participate and how to get started.</li> </ul>
<b>Pre-Trial LNP Course</b>	<b>2 days</b>	<ul style="list-style-type: none"> <li>• Will facilitate smooth flow toward trial start-up for all participants. Includes planning, engineering, provisioning, installing, and operational considerations.</li> </ul>
<b>Pre-Trial Technical Course</b>	<b>3 days</b>	<ul style="list-style-type: none"> <li>• Covers AIN/IN Architecture for engineers and technicians who will program/datafill network elements.</li> </ul>
<b>Test planning and Performance Course</b>	<b>2 days</b>	<ul style="list-style-type: none"> <li>• Helps ensure that all participants take every opportunity to obtain credible and successful results, and that test supports long-term requirements.</li> <li>• Addresses post-trial activities.</li> </ul>
<b>Broad-Scale Implementation Training Course</b>	<b>5 days</b>	<ul style="list-style-type: none"> <li>• Prepares participants for broad-scale implementation</li> </ul>

Technical training requirements for planning and implementation engineers include the following:

- Each participating DMS-100 will require a datafill modification to enable the switch to initiate AIN 0.1 queries and respond appropriately. During the pre-trial phase, MCImetro or NORTEL will provide the architectural knowledge required to implement the modifications to one or two people from each participating Local Service Provider. Service providers must assign responsibility to individuals skilled in DMS-100 translations and AIN 0.1.
- Each participating Siemens Stromberg-Carlson EWSD switch will require additional software and a datafill modification to enable the switch to initiate TR queries and respond appropriately. During the pre-trial phase, MCImetro or Siemens Stromberg-Carlson will provide the necessary architectural knowledge required to implement these changes to one or two people from each participating Local Service Provider. These individuals must be skilled in EWSD translations.
- Each other participating switch, including those of IXC's, will require a datafill modification to enable the switch to initiate AIN 0.1 queries or IN

queries and respond appropriately. During the pre-trial phase, MCImetro will provide the necessary architectural knowledge required to implement the modification to one or two people from each participating Local Service Provider. Assigned people must be skilled in translations on the participating switch and in IN or AIN 0.1, as appropriate. Courses involving operations or translations on other switches will require additional planning and coordination during the early pre-trial period.

We will coordinate training schedules and locations with participants. Preliminary schedules will be distributed at our proposed inaugural meeting in July 1995. Coordination activities will include exploration of video teleconferencing and other approaches that will minimize travel time and maximize value of training time.

## **5. COSTS TO TRIAL COMPANIES**

**As stated in Sections 1 and 2 of this RFP, it is the intent of the Companies to find a Provider who will provide the Products and Services specified in this RFP at no charge during the term of the trial. Provider must state in response to this Section that it will provide the Products and Services at no charge.**

MCImetro will provide all Products and Services pertaining to the New York State Number Portability Trial, RFP No. 9501, at no charge. This commitment includes all pre-trial and trial Products and Services. It also includes all Products and Services pertaining to trial exit actions, testing, and turnover, as well as all RFP-requested post-trial activities, including the final report to be submitted to NYPSC.

## **APPENDIX A.**

### **A.1. Provider Authority Statement**

The proposer represents and certifies as part of the Proposal that he/she is authorized to act as an agent for the corporation responsible for this Proposal.

*Signature of Approving Authority*

A handwritten signature in black ink that reads "H. Douglas Black". The signature is written in a cursive style with a large, stylized "H" and "B".

*Title*                      H. Douglas Black  
Director, Switch Systems Engineering & Planning

*Date*                      May 4, 1995



## **APPENDIX B**

### **B. 1. Hazardous Material Statement**

**Hazardous Material is defined as a substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce.**

**There are two general classes of Hazardous Material, Physical and Health.**

**A "Physical Hazard" is defined as any material, chemical, or solid, for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, and oxidizer, pyrophonic, unstable (reactive) or water-reactive.**

**A "Health Hazard" is defined as any material, chemical, or solid, for which there is statistically valid evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. Inclusive in the term "Health Hazard" are materials considered to be carcinogens, toxic, or highly toxic agent, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs skin, eyes or mucous membranes.**

**These definitions of Hazardous Material have been summarized from the code of Federal regulations, Title 49, Transportation (Sec. 17 1. 8), and the Federal Register (Vol. 48, No. 228, 11-25-83).**

**Do any of the products to be furnished by Provider (whether manufactured by Provider) not under this RFP or any portion thereof contain hazardous material?**

**Yes \* (If Yes, Provider must fill out a MATERIAL SAFETY DATA SHEET [OSHA Form 20 or its equivalent] and include it with your response to this UP.)**

**No \*\* (If No, Provider must attach a letter on Company letterhead identifying the product and stating that there is no requirement for MATERIAL SAFETY DATA SHEETS.) a "health hazard" is defined as any material, chemical, or solid, for which there is statistically valid.**

**No; i.e., Provider will furnish no products containing hazardous material. Provider has attached a letter on company letterhead, identifying our product and stating that there is no requirement for MATERIAL SAFETY DATA SHEETS.**